No. 1, 25 feet high, 13 inches in circumference near base.
No. 2, 32 feet 8 inches high, 13 inches " "
No. 3, 31 " 1 inch " 16 " " "

THE MISTLETOE is frequent in this region and always, so far as I have observed, found on *Nyssa multiflora* or *Acer rubrum*. In last September it was seen in fine fruit and also in full flower. The books which I can consult, give the flowering period as April or May. This, I believe, is correct in the far south. Can it be that in more northern localities it flowers in the fall and perfects its fruit the next year, as is the case with *Hamamelis* and *Alnus maritima*? I should be glad to have information upon this point.—WM. M. CANBY.

Calamagrostis Howellii, n. sp.—Culms densely tufted, 10-20 inches high, erect, or somewhat geniculate below, smooth; radical leaves loosely setaceous involute, firm but not rigid, in length nearly equalling or even exceeding the culm, ligule conspicuous, about 1½ lines long, scarious, culm leaves about 3, narrow or filiform, 4 to 8 inches long, the upper one equalling the culm; panicle pyramidal, 2 to 4 inches long, loose and spreading, rays mostly in fives, lower ones 1 to 1½ inches long, numerously flowered above the middle; spikelets pale green or purple tinged, outer glumes lanceolate, acute, 2½ to 3 lines long, nearly equal, membranaceous, 1-nerved or the upper indistinctly 3-nerved, flowering glume slightly shorter than the outer ones, ovate-lanceolate, acute, 4-nerved above, the apex with 2 mucrouate pointed teeth, the conspicuous strong awn inserted about the lower third, half an inch long, palet rather shorter than its glume, bidentate at the apex, basal hairs about half as long as the flower, those of the rudiment rather longer.

A well marked and handsome species, remarkable for the long setaceous leaves, both radical and cauline, and for the open panicle and conspicuous awns. It is named for the discoverer, *T. J. Howell*, Oregon.—GEO. VASEY.

Blight.—Editors BOTANICAL GAZETTE:—Please permit me to call the attention of your readers who are adepts in the use of the compound microscope, to the subject of disease in plants by *bacteria*. Last year accounts of my own investigations were published in the transactions of the American Association for the Advancement of Science, Scientific American, American Naturalist, and elsewhere. These had special reference to the so called "fire blight" of the pear and "twig-blight" of the apple tree. Some much more limited studies upon the "yellows" of the peach were also published in "Science." The proofs offered in these accounts were such as:—

1. The uniform presence of a certain species of *Bacterium* in the dying tissues.

2. The appearance of the disease upon inoculating healthy limbs with this *Bacterium*.

3. The observed multiplication of the organism and the gradual spread of the disease from the point of inoculation.

The results fully convinced me that these diseases of our orchard trees are directly due to the operations of this minute cryptogamic

plant, whatever may be the indirect surroundings and conditions rendering such operations possible. The experiments of last year have been repeated and verified during the present season (1881), and further research has shown that fruit trees are in no wise peculiar in this respect. Many other plants suffer in a similar manner from the same cause. Among trees, none are more certainly and surely destroyed in this way than the Lombardy poplar, whose dead or dying spires so commonly attract the attention of the most casual observers throughout our land. *Populus tremuloides* dies still more apparently like the pear tree. The butternut and the linden succumb to the same destroyer. Ash and elm trees do not fully escape; the maples, especially the "sugar tree," often similarly suffer. Shrubs and herbaceous plants are also injured or killed outright by the avaricious, omnivorous little creatures. The leaves of the white flowered lilac wither upon their stems before they have half filled their proper duties, and those of the common pæony die while the summer's sun invites them to fuller development and activity.

In these and many other instances, the destroying agent is almost surely one and the same, though the appearance and even characteristics differ very much in the resulting effects upon different subjects. The pear tree more commonly becomes diseased throughout the entire stem and its appendages, while the young twigs of the apple tree often alone perish or a limited area of the bark upon the trunk dies. In the lilac it is the leaves which suffer, the branchlets bearing them continuing in perfect health. In the case of the Lombardy poplar the small limbs perish only because the larger parts are destroyed. So far as I have observed, the leaves are not at all infected. If the yellows of the peach is really due to the same specific *Bacterium*, a still further difference is shown, for this tree does not die by inches, the disease beginning in some well-defined place, and gradually spreading, as in the other cases. The whole top languishes, and it has been supposed that the roots were also involved. My studies upon this disease have been confined to severed specimens sent to me through the mail, but in no instance have I found the pieces of roots taken from diseased trees infected with bacteria; the diseased limbs always are. In the pear, apple, poplar, etc., the roots are *never* the seat of the disease, and become infected, if at all, only through the contagion from the trunk.

Inoculations with fresh material (bacteria) are as certain to communicate the disease as are similar operations upon animals. Vaccination as practiced against small-pox is not successful in a greater number of instances than is this method of producing blight. In last year's experiments sixty three per cent. of the total number of inoculations in pear and apple unmistakably communicated the disease. By operating on what became known as the most susceptible parts and kinds, a much greater per cent. succeeded, approaching near to one hundred. Similar punctures with a clean needle had no effect whatever. Application to the outside of the unbroken epidermis was ineffectual. These results are corroborated by similar experiments this year, not however prosecuted to the same extent.

There are to my mind many interesting questions left unsolved,

but the main proposition is, it seems to me, as thoroughly demonstrated as any physiological or pathological matter can be. There are no speculations or unfounded theories admitted; experiments, observations and results. I should be pleased to know if others have tried such experiments.—T. J. BURRILL.

Forest Notes.—While on a recent trip in the Boston Mountains, I found *Acer rubrum* growing several hundred feet above the drainage of the surrounding country on sandy, dry ridges. It surprised me because I had never found this species growing in the river bottoms of this region where *Acer dasycarpum* is quite common.

I had always thought that *Acer rubrum* was confined to the low country. I found *A. saccharinum* growing in the same situations.

Carya myristicæformis was found, for the first time in this State, last summer, in the Red River bottom above Fulton, and this summer, it was observed in great abundance in South-Eastern Arkansas, from about Pine Bluff almost to the south boundary, growing with *Carya aquatica* in low situations. The nut of this species is about the size of a pecan, and is edible. It is called swamp hickory by the natives, and in some localities "conscript hickory-nut," by the darkies.

Planera aquatica is distributed throughout Eastern and Southern Arkansas.

Quercus Michauxii is the principal species of the white oaks found in South-Eastern Arkansas. It assumes majestic proportions, some specimens having a diameter of 19 feet.

A specimen of *Euonymus atropurpureus*, 7 inches in diameter, and 30 feet high, was observed in the vicinity of Little Rock. The tree was full of fruit, and the identification thus made easy and certain.

We were surprised by not seeing any of the *Magnolias* in South-Eastern Arkansas, as we had expected to find several species.

Pinus Tæda grows in Arkansas as far north as Little Rock. This species and *P. mitis* are the members of this genus we have found in the State.—F. L. HARVEY, *Fayetteville, Ark.*

Hieracium aurantiacum.—Mr. Meehan on page 265 of the current number of the Gazette, in speaking of *Hieracium aurantiacum L.* (*Crepis*), desires that stations may be recorded. In volume V. of the Bulletin of the Torrey Botanical Club, page 32, I recorded its first appearance in this State. This was in 1874. Since then I have observed it every year, but have not seen in it any decided tendency to increase. As it is proliferous at the base, it would seem well calculated to spread. It has been found by Mr. Arnold Green, Mr. Thomas Battey and myself at various points in this State. I have a location for it here in the city of Providence, in one corner only of a hayfield, from which it has extended into the street. The lot, although nominally in the city, is in effect far removed from the town proper. It is always possible to collect here a number of plants, and I usually keep a stock for distribution.—W. WHITMAN BAILEY.

Andropogon and Amarantaceæ.—As you correctly remark, it looks queer to see the genus *Andropogon* among the *Amarantaceæ*, as